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THE HOME VINEYARD

BY L. O. BONNET

CONTENTS

Uses of Grapes.—The grape is one of the best of home fruits. The abundant foliage with its changing tints and the fruit with its varied forms and colors add much to the attractiveness of the garden, and the ease with which the vines can be trained facilitates their use as ornamentals. But the chief value of the home vineyard lies in the abundance and utility of the crop.

The home vineyard should be so planned that it will furnish the table with fresh fruit of various colors, shapes, and flavors during the whole grape season, from July to November. It should also provide the family with raisins, grape syrup, grape juice, jellies, marmalades, and vinegar, all of the best quality. To accomplish this, several kinds of grapes, wisely chosen from the extremely varied and numerous varieties, must be grown.

Grape Culture in California.—California, with its variety of suitable climates, is so well adapted to the culture of grapes that it is possible to grow in the open, in some locality, all of the varieties used in the vineyards and in the hothouse graperies of the world.

Eastern grapes, with their marked acidity and peculiar flavor, pleasing to some people, and suitable for grape juice and jellies, thrive in the fog belt and the coastal regions. Less satisfactory results will usually be obtained with these grapes when they are grown in the hot interior valleys.

The European or Vinifera vine with its innumerable varieties is adapted to many different climates and soils and can be grown almost everywhere in California. Some varieties are especially adapted to cool locations, while others will give the best results when planted in warm regions.

Vinifera varieties may be divided into three groups, classified as table grapes, wine grapes, and raisin grapes. The table grapes, namely, varieties suitable to be eaten as fresh fruit, may be placed in two categories, poor shippers and good shippers. Many of the poor shippers are better for eating than are the good shippers. The term "wine grapes" refers to a large number of varieties of grapes. These grapes generally have small berries whose juice can be easily extracted and which possess a neutral or more or less pronounced flavor. They are especially suitable for the manufacture of grape juices and grape syrups. Raisin grapes are those whose high sugar content, desirable flavor, size, or seedlessness make them suitable for drying.

VARIETIES FOR THE HOME VINEYARD

The list of grapes given in Table 1 contains an assortment of the choicest table grapes, a few raisin varieties, and a certain number of varieties suitable for the production of grape juice and other grape products.

From this list many selected groups for home vineyards may be made to suit the taste of the amateur grape grower, and to fit the climatic conditions of a locality. A complete group would be one from which all types of grape products could be made. The varieties should also be selected from the point of view of their time of ripening so that a successtion of ripe grapes may be secured. It is obvious that they should be varied in shape, flavor, size and color.

If the vines are to be grown for an arbor they should be selected from the most vigorous varieties, though almost any vine can be used for this purpose.

All this various and interesting diversity can be obtained by using Table 1 with the explanation of abbreviations contained in Table 2.

TABLE 1

LIST OF VARIETIES

Variety	Shape and Flavor	Size	Color	Period	Vigor and Climate
1. Agawam	sf	m	r	e	aac
2. Alicante, Black	s	l	b	m	h
3. Appley Towers	o	l	b	m	h
4. Bellino	s	l	b	e	h
5. Chasselas rose	s	m	r	ve	wc
6. Chaouch	o	vl	w	ve	h
7. Ciprollnero	o	l	rb	m	h
8. Colman, Gros	s	vl	b	m	ah
*9. Corinth, Black	s	vs	br	ve	aah
10. Cornichon, Black	e	l	b	l	ah
11. Damas rose	s	vl	r	m	h
12. Damascus, Black	o	l	b	m	h
13. Danugue	s	l	b	m	ahc
14. Dattier	e	vl	w	m	ah
15. Dizmar	o	l	w	ve	aah
16. Doigt de Déesse	e	vl	r	m	ah
17. Duc de Magenta	s	m	b	e	hc
18. Emperor	e	l	rb	l	ah
19. English Colossal	e	m	b	ve	h
20. Grec rouge	s	m	r	m	c
21. Henab	o	l	r	m	ah
22. Hunisa	e	l	br	m	h
23. Khalili	o	m	w	ve	wh

TABLE 1—(*Continued*)

	Variety	Shape and Flavor	Size	Color	Period	Vigor and Climate
24.	Kurtelaska	o	l	w	e	h
25.	Luglienga	o	m	w	ve	ch
26.	Madresfield Court	om	l	b	m	h
27.	Malaga	o	l	w	m	h
28.	Malvasia bianca	sm	m	w	m	ach
29.	Molinera	s	l	r	m	ahc
30.	Mavron	o	l	r	l*	h
*31.	Monukka, Black	e	m	b	ve	ahc
32.	Morocco, Black	s	vl	b	vl	h
33.	Moscatello fino	om	m	b	m	hc
34.	Muscat, Flame	om	l	r	m	hc
35.	Muscat of Alexandria	om	l	w	m	hc
36.	Napoleon	s	l	w	e	c
37.	Niagara	sf	m	w	e	aac
38.	Olivette blanche	e	l	w	vl	h
39.	Olivette rose	e	m	r	l	h
40.	Palomino	s	m	w	m	ach
41.	Panse de Roquevaire	e	l	w	m	h
42.	Paykani	e	m	r	ve	aah
43.	Pierce Isabella	sf	l	b	m	aac
44.	Portuguese, Blue	s	m	b	ve	c
45.	Prune de Cazouls	e	l	b	m	h
46.	Quagliano	s	l	b	m	h
47.	Queen, Golden	o	l	w	m	ah
48.	Raisin du St. Pére	e	sm	w	m	ch
49.	Servan	s	l	w	vl	ch
*50.	Sultanina, Rose	o	s	r	e	aac
51.	Terret Monstre	e	vl	w	m	h
52.	Trentham, Black	o	l	b	m	h
53.	Ohanez	o	l	w	vl	ah

TABLE 2

EXPLANATION OF ABBREVIATIONS IN TABLE 1

Shape and Flavor	Size	Color	Period	Vigor and Climate
e = elongated	l = large	w = white	ve = very early	a = very vigorous suitable for arbors
o = oval	m = medium	r = red	e = early	w = small vine
s = spherical	s = small	b = black	m = mid season	h = hot regions
m = muscat flavor	vl = very large		l = late	c = cool regions
				* = seedless
f = concord flavor			vl = very late	aa = do well only on trellis or arbor

Combinations indicate variations due to climate. For example, rb indicates that the grape is red in a warm climate and black in a cool one.

Typical examples of a complete group for cool regions and for warm regions are given in Table 3.

TABLE 3

Typical Complete Groups for Cool and Warm Regions

Period	Color	Cool regions	Warm regions
Very Early	White	25	6, 15, 23
	Red	5	42
	Black	31, 44	19, 31
Early	White	24	24
	Red	1, 9	9
	Black	17	4, 17
Mid-season	White	14, 40	14, 27, 28, 35, 47
	Red	11, 16, 20, 35, 50	7, 21, 29, 34, 22
	Black	13, 26, 43	12, 13
Late	White	49	49
	Red	30, 39	18, 30
	Black	10	32
Very Late	White		38, 53

TABLE 4

Varieties for Special Purposes

Seedless grapes	9, 31, 50
Grapes for juice	28, 33, 40, 43
Grapes for jelly	1, 28, 34, 35, 37, 43
Grapes for preserving	28, 33, 35
Grapes for arbor	1, 8, 9, 10, 13, 14, 15, 16, 18, 20, 28, 29, 31, 39, 40, 42, 43, 47, 50, 53
Grapes with muscat flavor	26, 28, 33, 34, 35
Eastern grapes (slip skins)	1, 37, 43
Raisin grapes	9, 31, 35, 40

PROPAGATION OF VINES

The propagation of vines is easy and is generally done by means of cuttings or rootings. In a phylloxera-infested area resistant stocks must be planted. These stocks are generally grown in the nursery as ungrafted or grafted cuttings before they are planted out in the field. For details on this subject consult Circular No. 225 and Bulletin No. 331 of the Agricultural Experiment Station.

PREPARATION OF GROUND AND PLANTING

Before planting, the ground must be plowed or dug twelve inches or deeper, especially in heavy soils. When the soil has been plowed to a depth of fourteen to sixteen inches, cuttings or rootings can be planted with a dibble; otherwise holes must be dug.

The distances at which vines should be planted depend upon the soil and climate, the shape and size of an arbor, etc. In cool climates vines can be planted according to the square system at 7×7 or 8×8 feet; or according to the avenue system at 6×10, 6×12, or 7×12 feet. In warmer regions the following distances may be adopted, 9×9, 10×10, and 7×12, 7×14, 8×10, 8×12 feet. The more vigorous the variety and the more favorable the conditions for growth the more space each vine should have. For covering ornamental arbors or fences around the house the vines should be planted so that they have at least these spaces available for root growth. (See cover cut.)

To insure the rooting of cuttings, the soil should be well packed around the base, and one bud alone left above ground. In planting rooted cuttings, the top must be pruned to one shoot with two buds and the roots cut back to about three inches. When they are planted with a dibble, the roots must be cut back to about one-fourth of an inch.

Packing the soil around the roots should be done carefully. With grafted vines the union must be put at or slightly above the level of the ground and otherwise planted like rootings. It is a good practice when planting to mound the soil around the unions.

SUPPORTS

Stakes.—Under certain systems of pruning, the vines must be supported temporarily until they are able to support themselves. With other methods of pruning they need supports permanently.

Stakes used in vineyards may be classed as (*a*) temporary, (*b*) semipermanent, and (*c*) permanent stakes. For temporary stakes the following sizes are desirable: $1'' \times 1'' \times 40''$ for trellised vines and $2'' \times 2'' \times 4'$ for vase-form pruned vines.

Semipermanent stakes, with a probable duration of five to eight years, measure 3 to 4 feet for grafted vines or ungrafted vines with short trunks, and 6 feet for those with long trunks.

Finally, permanent stakes for long pruned vines measure generally $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times 6'$. Stakes 5 feet long, however, are sufficient for the support of a trellis.

Trellises.—The varieties of grapes requiring long pruning and those trained as horizontal cordons need trellising to secure the best results. A trellis requires 7-foot end posts on which to stretch the wires, 5-foot stakes to support the wires, and 40-inch pickets as temporary supports for the vines. End posts are generally made of redwood. Split redwood end posts are better than sawed posts. They must be $4'' \times 5'' \times 7'$, and set slanting slightly outward from the row with about three feet and a half in the ground. The permanent stakes supporting the strands of wire must be put between the vines and not just by them. This disposition presupposes that when the vines were started they were supported by temporary stakes or pickets. Placing the stakes every three or four vines according to the distance at which they are planted or according to their vigor and between the vines has several advantages over the ordinary method of putting them at the vines. Generally two strands of galvanized wire are used in trellises. The lower wire is generally of No. 11 and the upper wire of No. 13. The height at which the strands are set from the ground depends upon several factors. Wires are held by staples and in such a way that they can be stretched easily. Figure 3 corresponds to the type of trellises described above.

ARBORS

Arbors vary widely in design. There is no typical shape of arbor, and the size also, may vary to a large extent. They are generally intended to shade the entrances of houses, or to cover verandas, or garden walks. (See cover cut and Fig. 1.) They are used commercially in some countries for the production of late table grapes.

Vines can easily be trained to almost any form. Certain varieties, because of their vigor, climb more rapidly than others and are generally considered good arbor grapes. However, it is possible to grow medium or weak varieties on arbors when they are trained properly. The principle to apply to arbor vines is that a strong root system must be developed before attempting to form the trunk. Without a strong root system it is impossible to make a vine climb quickly and be vigorous. The procedure will be as follows:

First year: Plant a rooting or a cutting and give it the best care without pruning or pinching it during the whole growing season.

Second year: In winter after the leaves have fallen, prune off all canes but the best one, which should be cut back to two buds. In spring when the shoots start, remove all but one after the danger of frosts is over and tie it to the support every fifteen or eighteen inches.

The more vertical a shoot grows the longer it gets. Pinch the growing tips of any strong laterals that may form on the main shoot. When the shoot has reached the top of the arbor the main difficulty has been overcome. From this point it may be spread over the arbor, care being taken to prune according to the usual method applied to the variety. If the growth during the second year is not satisfactory, prune and train the vine the third year as was done during the second year.

Fig. 1

TREATMENT OF YOUNG VINES THE FIRST, SECOND, AND THIRD YEARS

During the first growing season, the vines should be hoed and cultivated several times. Early summer irrigations should be given when possible. No removel of shoots nor pinching is necessary during the first year, except in the hottest and most fertile regions, nor is staking necessary.

Before the second growing season begins, the vines must be pruned by leaving one spur with two buds from which to grow a single cane which will develop into the final trunk. The trunk may be formed the first year if one cane is sufficiently long and strong. The vines should be staked before they begin to sprout. One shoot only should be kept on each vine and tied securely to the stake. If an arbor is desired, the shoot must be kept as vertical as possible in order to obtain a long and straight growth. At the end of the second growing season the trunk of the vine is formed. Pruning at this time will

consist of cutting the single cane to the height at which the head of the vine is desired. Laterals if they have been produced may be utilized to start the arms of the vine.

During the third growing season shoots will grow from the upper part of this cane and all shoots within 8 or 10 inches of the ground should be removed as soon as they start. Shoots which will be needed the following year for spurs, or fruit canes, or for extending the vine over an arbor the next year, should be allowed to grow freely without summer pruning. All other shoots should be prevented from growing too vigorously by pinching off the growing tip when they are less than 18 inches long.

Fig. 2.—Vase formed vine.

TREATMENT OF FULL BEARING VINES

Pruning.—Among the numerous systems of pruning vines, the ordinary vase form and the bilateral cordon are to be recommended for the home vineyard. Nearly all of the varieties contained in Table 1 will give good results with these two types of pruning. The varieties of the list requiring long pruning are the Sultanina and the Black Corinth. The latter must also be girdled during blossoming to yield satisfactorily.

Fig. 2 shows a three-year-old vine pruned with a vase formed head. The trunk is perfect and the head is formed of three well spaced spurs with two buds each.

Fig. 3 shows a vine pruned as a bilateral horizontal cordon. A cordon is a long trunk, usually horizontal, on which short arms bearing the fruit spurs are distributed. In covering an arbor modifications of this system are used. The trunks vary in length and direction according to the space to be covered.

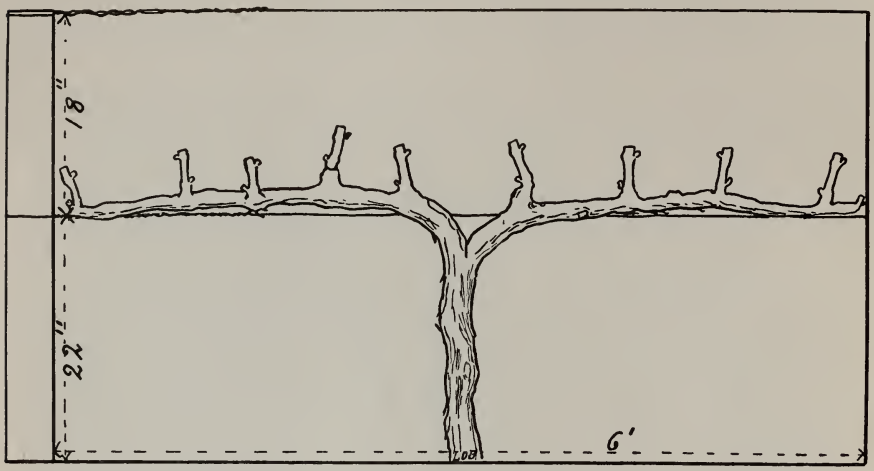

Fig. 3.—Bilateral horizontal cordon.

Bearing vines should be carefully pruned every winter after the fall of the leaves. On a vine of average vigor about two thirds of the canes should be removed entirely and the rest pruned back to spurs of 2 to 3 buds. In long pruning, canes of from 2 to 4 feet for fruit and wood spurs of 1 or 2 buds to produce fruit canes for the following year are left. The total number of buds left will be about the same with each system. Weak vines should be pruned more severely. Very vigorous vines should be allowed more buds. The number of buds on spurs and canes should be in proportion to their vigor or size. Which canes to leave will depend on their position. Vigorous canes so placed that they will conserve or improve the shape of the vine should be chosen for spurs and fruit canes.

Cultivation.—Each year the home vineyard should be plowed and hoed. The number of plowings and hoeings will depend upon whether irrigation is practiced or not. In any case the vineyard should be plowed to a depth of six to eight inches and the soil well loosened, before the buds sprout. Then the vines should be hoed. If irrigation is practiced the soil should be cultivated after each irrigation. The vineyard should be kept free from weeds and supplied with a good soil mulch up to the picking of late grapes.

Irrigation.—Irrigation where the rainfall is less than 16 inches will increase the quality and yield. Where the rainfall is less than 7 to 10 inches a late winter irrigation is beneficial. Generally two moderate irrigations one after the blossoming and one several weeks before ripening will be sufficient to secure good results.

Diseases.—The most common disease with which the amateur grape grower will have to contend is the *Oidium* or Powdery Mildew.

Oidium, or Powdery Mildew, is caused by a fungus which attacks all green parts of shoots and fruit. It is successfully combated by the use of powdered sulfur dusted on the foliage and on the bunches of grapes. Two to four dustings applied from the time the shoots measure six to eight inches up to the beginning of ripening will give efficient protection.

Pests.—Insect pests cause more damage to vines than do fungus diseases. The three most common insects the home vineyardist will have to fight are cut worm, grape leaf hopper, and Phylloxera.

Cut worms sometimes begin to destroy buds before the vines are sprouting, but they generally begin during sprouting. As soon as noticed they should be combated. If chickens are allowed to run in the vineyard, they will gather up the worms efficiently; if this is not feasible, the use of poisoned bait is the most efficient method of destroying cut worms. One of the following formulas may be used: (1) Arsenite of soda, 1 pound; syrup or molasses, 2 pounds; water, 10 gallons. Chop alfalfa and dip in this solution. (2) Paris green, 1 pound; molasses, half a gallon; water, 4 gallons, and bran, 25 pounds. A teaspoonful of one of these mixtures should be placed around the trunk without touching it or any other part of the vine.

The grape leaf hopper is found all over California and causes great injury to the vine and the crop when it occurs in large numbers. It is best combated when in its larval stage from May to June, according to the climatic conditions of the locality. When the majority of eggs laid by the over-wintering adults have hatched and before any hoppers have become winged, is the time to control them. The means of control are spraying and dusting.

The following spray formula is recommended:

One pint of Black Leaf 40 to 150 gallons of water; soap, 6 pounds. In spraying, the leaves must be hit from below. Thoroughness is the keynote of success.

Dusting with mixtures known in the trade as Nico-Dust is still in the experimental stage. Of all the mixtures, those containing sulfur seem to be the most efficient. Here again the dust must be directed

from below in order to hit the hoppers. Dusting is not so efficient as spraying.

The Phylloxera is a minute yellowish insect attacking the roots of vines and causing their death in a few years. Very sandy soils are considered immune to the pest. When a region is infested, the only way to establish a good vineyard is to plant vines grafted on resistant stock. Among the best resistant stocks are: Chasselas × Berlandieri 41 B, Riparia × Rupestris 3309 and 3306; Riparia × Berlandieri 420 A, and Aramon × Rupestris Ganzin No. 1.

REFERENCES

For general publications on grapes address:

1. Editor in Chief, Division of Publications, U. S. D. A., Washington, D. C.
2. State Department of Agriculture, Sacramento, Calif.
3. College of Agriculture, Berkeley, Calif.

Many recent publications will be sent free on application to these three addresses. Publications which are out of print can often be found at a local library.

The viticultural publications of the College of Agriculture at the present time available for distribution are the following:

1. "Vine Pruning in California." Bul. 241 and 246.
2. "Seedless Raisin Grapes." Bul. 298.
3. "Phylloxera-Resistant Stocks." Bul. 331.
4. "Hot Room Callusing." Circ. 76.
5. "Grafting Vinifera Vineyards." Circ. 115.
6. "Spraying for the Grape Leaf Hopper." Circ. 126.
7. "Oidium or Powdery Mildew of the Vine." Circ. 144.
8. "Prunning the Seedless Grapes." Circ. 191.
9. "Propagation of Vines." Circ. 225.
10. "Protection of Vineyards from Phylloxera." Circ. 226.
11. "Vineyard Irrigation in Arid Climates." Circ. 228.
12. "Cordon Pruning." Circ. 229.

There is no book in English treating fully the cultivation of the vine in California, but valuable information may be found in the following:

"Manual of American Grape Growing." U. P. Hedrick. The Macmillan Company, New York.

"California Fruits." E. J. Wickson. Pacific Rural Press, San Francisco.

The Agriculture College of the University of California offers a correspondence course in Grape-Growing, which may be taken for a small fee.